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NOTES AND LITERATURE.

GENERAL BIOLOGY.

Mendelism and Cytology.¹—Guyer's doctor's thesis written in 1900 but printed and distributed in the latter half of 1903 is remarkable for its "anticipation" of Mendel's law of purity of the germ cells, the outcome, unlike Mendel's results, of a cytological study. He first describes the course of spermatogenesis in normal pigeons. The spermatogonia (the ancestral sperm cells immediately preceding the reduction stages) contain 16 chromosomes which are split in the cell division that forms the primary spermatocyte. As the primary spermatocyte grows, synapsis, or a fusion of the chromosomes in pairs, occurs; and this Guyer interprets as the conjugation of maternal and paternal chromosomes. Eight thick rings are formed which break equatorially in the division by which the secondary spermatocytes are produced. When the secondary spermatocytes divide to form the young spermatozoa only four chromosomes are to be seen. These chromosomes Guyer regards as quadrivalent and he suggests that "reduction" takes place when they divide.

He suggests that the reduction division of the four-fold chromosomes may be in any plane and so varying combinations of maternal and paternal qualities will go to each spermatozoon. Thus it might happen that in the division the maternal and paternal qualities were segregated (and this he regards as the prevalent result in hybrids); or it might happen that some of both the maternal and paternal chromatin went to each spermatozoon. The "purpose" of the formation of the quadrivalent chromosomes is to give greater variability.

In respect to hybrid pigeons, Guyer notes that the offspring of the common brown ring dove mated with a white ring dove are brown. The offspring of these brown hybrids are either white or brown and the latter color predominates. The author says (p. 36): "This points to the conclusion that in the brown birds we may have

¹ Guyer, Michael F. *Spermatogenesis of Normal and of Hybrid Pigeons*. A. Dissertation, etc. University of Chicago, Chicago; 1900. 61 pp., 2 (double) plates. [Distributed (and printed?) 1903.]

both intermediate forms like the hybrids of the second generation and forms which have reverted to the brown grandparent, as the white doves have seemingly returned to the white grandparent." Here we have a clear recognition of what Mendel calls dominance! Also, this, (p. 48): "If a spermatozoön and an egg containing characteristics of the same species unite, then the reversion will be to that of the species; if a sperm cell containing the characteristics of one species happens to unite with an ovum containing characteristics of the other species, then the offspring will be of the mixed type again. By the law of probability the latter will be the more prevalent occurrence, because there are four combinations possible, and two of the four would result in the production of mixed offspring, while only one combination could result in a return to one of the ancestral species." Here we have even the quantitative part of Mendel's law expressed in 1900!

The foregoing Mendelian generalizations are suggested by the behavior of the hybrid germ cells in the spermatogenic stages. The mitoses are frequently abnormal—two spindles lying side by side, owing to the fact that the chromosomes are segregated in different parts of the cell. This segregation suggests an incompatibility between the chromosomes of the two species—and it results in "pure" germ cells—with the parental qualities segregated.

Finally, the all too brief chapter of suggestions will repay careful study. It is regrettable that so notable a contribution to the mechanism of heredity should have been so long delayed in appearing.

C. B. D.

Inheritance of Acquired Mental Characteristics.¹—A Chicago solicitor of patents has written a book on heredity that is bold and in many respects crude, but which presents so many facts that it warrants respectful consideration. The subject is the control of the intellectual quality of the offspring by the intellectual activity of the parents. The thesis is that the descendants of intellectually active parents inherit the latter's activity so that, within limits, the more active during a given time the parents have been, or the longer the time of their activity, the more intellectually active the offspring, the greater their chance of achieving eminence. It is nothing new, of course, that the offspring of intellectual or successfully active people are especially apt to have eminent progeny, but it is rather new to

¹Redfield, C. L. *Control of Heredity. A Study of the Genesis of Evolution and Degeneracy.* Chicago, A. C. Clark, 1903. 8vo. 343 pp., illustrated.